Hemorheological factors can be informative in comparing treatment possibilities of abdominal compartment syndrome

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Abdominal compartment syndrome (ACS) is a severe, life-threatening condition. However, its pathomechanism has not been completely clarified yet, furthermore, the surgical therapy still needs optimization as well. We aimed to investigate microcirculatory and micro-rheological alterations in ACS, using various temporary abdominal closure (TAC) methods, including three settings of vacuum-assisted closure technique. On anesthetized pigs, by intraabdominally placed and filled-up silicone bags, intraabdominal pressure (IAP) at 30 mmHg was maintained for 3 hours, and then decompressive median laparotomy happened. In different experimental groups the abdominal wall was closed by regular suturing techniques, or, alternatively, TAC was maintained for 2 hours using Bogota-bag, or by applying Vivano-sets at -50, -100, or -150 mmHg vacuum values. IAP was monitored by implanted sensors, hemorheological parameters were determined (hourly sampling from cannulated external jugular vein and femoral artery), and laser Doppler flowmetry tests were performed on the liver, kidney, small bowel and the pancreas before and after the TAC period. ACS resulted in significant impairment of macro- and micro-rheological parameters and microcirculation of abdominal organs. All of the used temporary abdominal closure techniques improved the results, however, applying the Bogota-bag and the -150 mmHg vacuum set showed worse microcirculatory and micro-rheological data than the settings at -100 or -50 mmHg.